BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Science Pearson BTEC International Level 3 Diploma in Environmental Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Environmental Science
Unit number and title	**Unit 6: Principles and Applications of Chemistry II**
Learning aim(s)	**C:** Understand the principles of organic chemistry
Assignment title	**Principles of organic chemistry**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are a laboratory technician working in a university organic chemistry laboratory. You have a new junior technician starting and your supervisor has asked you to train them in the basic working knowledge of organic chemistry. You need to ensure that your new colleague understands that organic compounds have an important role to play in many industries such as the manufacture of food, fuel for transport, services such as the supply of energy to homes and industry, and ensuring the quality of water. They are also used and found in a wide range of products that we use, take as medicines and wear in everyday life. To help the new member of staff you are writing a briefing report that they can refer to as they learn their new job.

Task	In your role of laboratory technician you are required to write a detailed report to brief new members of staff in the basics of organic chemistry. It is important to include diagrams and/or photographs of 3-D models to illustrate structures. Your report should: • **Explain** why organic compounds are categorised by using functional groups (alkenes, halogenoalkanes, alcohols) and homologous series. Use the general formulae of a homologous series (alkanes, alkenes, halogenoalkanes, alcohols) to predict the molecular formulae of its members and predict the properties of the molecules containing the same functional group.

	• **Determine** the structures of a range of straight chain, branched and cyclic alkanes, alkenes, halogenoalkanes and alcohols using displayed and condensed structural formulae, skeletal formulae and 3-dimensional representations. Draw the structures of a range of the organic compounds using different representations such as dot-and-cross diagrams, stick diagrams and representations of sigma and pi orbitals. Name a range of the isomers and compounds when given the structural or skeletal formulae, using the International Union of Pure and Applied Chemistry (IUPAC) nomenclature • Use a variety of models (such as dot-and-cross diagrams, stick diagrams and representations of sigma and pi orbitals) to **describe** the difference in bonding between straight chain, branched and cyclic alkanes and alkenes. **Describe** the characteristics of saturated and unsaturated hydrocarbons such as bond angles, lengths and bond energies. • Assess the effect of structure on the physical properties (i.e. boiling point, solubility in water) of alkanes, alkenes, halogenoalkanes and alcohols. Assess the effect on a physical property with increasing chain length or branching, or the difference between a straight chain and cyclic compound with the same number of carbon atoms. This will require an explanation in terms of strength of intermolecular forces present and the reasons for this. Identify the functional group (or lack of it) on structures with the same number of carbon atoms, compare or predict the resulting effect on a physical property and provide justification for this. • **Explain** the different types of isomerism (structural isomerism, geometric isomerism – cis-trans stereoisomerism and E-Z stereoisomerism (including Cahn-Ingold-Prelog priority rules). Explain how isomerism can influence molecules with the same molecular formulae, functional group or belonging to the same homologous series e.g.effect on physical properties of organic molecules (boiling point, melting point, solubility in polar and non-polar solvents). • Assess the effect on a physical properties of different types of isomerism for molecules with the same molecular formula.
Checklist of evidence	

required	A report that includes: ● The determination of structures and names of organic compounds ● The difference in bonding between saturated and unsaturated compounds ● An explanation of the importance functional groups, homologous series and isomerism ● An assessment of the effect of structure on the physical properties of organic compounds

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
C.D3	Assess the effect of structure on the physical properties of organic compounds
C.M4	Explain the important of functional groups, homologous series and isomerism
C.P6	Describe the difference in bonding between saturated and unsaturated hydrocarbons
C.P5	Determine structures and names of organic compounds
Sources of information to support you with this Assignment	All sources of information suggested are UK based. Centres are free to amend these sources to those available in the Country of delivery where more appropriate. www.edu.rsc.org - organic chemistry starters www.STEM.org.uk - organic compounds www.chemhume.co.uk – introduction to organic chemistry Within the copyright laws learners could search YouTube for –organic compounds
Notes to the Assessor and technician	The practical activities suggested for this assignment are required to be safety checked by the Centre before use. Pearson Education can take no responsibility for the safety of any practical activities. Before doing any practical activity, you should always carry out your own risk assessment and refer to the necessary regulations. In particular, any local rules issued by your employer must be obeyed, regardless of what is suggested here. Centre should use Health and Safety information provided by a reputable source. In the UK such an example organization is CLEAPSS http://science.cleapss.org.uk/